7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

cal resources of other countries. It will be noted throughout this report that the Mission has made numerous recommendations for the procurement of foreign technical assistance. These recommendations are in no sense a disparagement of the talent and skills now available in Iraq. They represent rather a recognition that a country whose development has been severely handicapped by limited financial resources in the past cannot now suddenly expect to launch a development program involving rapid expansion in virtually every field without availing itself of the many opportunities to obtain technical help from abroad.

II. Agriculture

Any development program for Iraq must obviously put primary emphasis on agriculture. Over 60 percent of the population is engaged in agriculture, and both industry and commerce depend in turn largely upon farming and animal husbandry. Moreover, large increases in output can be realized both by raising the productivity of livestock and farm land already in use and by bringing under cultivation large areas presently idle.

Existing Conditions

Agriculture in Iraq is devoted largely to the cultivation of winter crops. Because of the lack of rain in the summer, during that season crops can be grown only under irrigation. In the rain-fed zone of the North, summer crops can be grown only on a moderate scale in small irrigated areas. In the irrigated zone of central and southern Iraq the limited water supply restricts the area devoted to summer crops to only about one quarter of that grown to winter crops. Barley and wheat are the only significant winter crops, while rice and, more recently, cotton are the principal summer crops. The area sown to sesame, corn, millet and grain sorghum is comparatively insignificant. Tobacco assumes some importance in the mountainous areas of the North. Fruit and vegetables are quite important. Iraq is the world's principal producer and exporter of dates; excellent citrus fruit is grown, particularly in the Diyala Valley in east-central Iraq, for domestic con-

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

sumption; and other fruits and nuts are cultivated, mainly in the North.

Livestock raising is an adjunct to agriculture rather than an integral part of it. Sheep and goats predominate because they thrive despite poor grazing and feeding. Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural population. Many peasants, however, have no livestock at all except for a draft animal or two. Livestock are left to forage for themselves, with only some supplementary feeding with straw and perhaps barley in the winter. Only livestock in and around the cities are systematically fed.

Crop yields are generally low. The water supply is frequently inadaquate. Agricultural methods have on the whole remained unchanged for centuries. Little or no animal manure or fertilizer is applied to the soil, animal dung being used largely for fuel. Crop rotation is wholly inadequate and makes little or no provision for soil-building crops. Salinity, attributable to poor drainage, has materially lowered the productivity of land in the irrigation zone. Owing to insufficient and poor draft animals and lack of proper equipment, the soil is often poorly prepared, and weeds detract from the yields. Up to half of the winter crop area is left fallow as a means of restoring fertility, but since the land is generally allowed to go up in weeds to afford grazing for animals, the efficacy of the fallow system is limited. The productivity of livestock is also low, primarily because of inadequate feeding, but also because of poor breeding, disease and insufficient shelter.

Except for some rather limited areas in various parts of Iraq and a promising settlement in the Dujaila district of south-central Iraq, the country is almost wholly devoid of peasant proprietors. The ownership of cultivated lands is largely in the hands of sheikhs and urban proprietors who entrust the actual cultivation in small parcels to sharecroppers. These sharecroppers have neither the equipment nor the knowledge to increase production and for the most part eke out a bare subsistence.[2] The land assigned to the

[2] According to the cadastral survey which is half completed, 67.1 percent of the privately-owned land is in units exceeding 1,000 donums. (One donum equals 0.25 hectares or 0.617761 acres.)

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

V. Production

A considerable part of Iraq's potentially large resources are as yet unutilized or ineffectively utilized. Most of the manpower on the land is underemployed for a large part of the year, and considerable unemployment exists in the major cities. Vast tracts of land await reclamation and irrigation before they can be used. Much of the available water is wasted owing to lack of storage and regulation of flow. Oil reserves have as yet been tapped only in relatively modest quantities. The output of the country is therefore still very low and the standard of living correspondingly depressed.

Agriculture and Livestock

Estimates of the area and output of the principal crops are given in the table below. Although the statistics are not very reliable, they give some indication of the relative importance of the various crops. Barley and wheat are clearly the dominant crops. Barley is one of the leading exports, and cereals altogether accounted for 43 percent by value of the country's exports other than oil in the period 1948-50. Rice is another important cereal. Cotton is now vying with rice as the leading summer crop. Stimulated by high prices and government encouragement, the area planted to cotton has risen rapidly in recent years. In 1951, probably about 580,000 donums were put in cotton—almost five times the amount in the preceding year. Other summer crops are comparatively insignificant. Some sesame is grown for oil, and some corn, millet and grain sorghum. Tobacco assumes importance only in the mountainous area of the North. Virtually no crops are grown for animal fodder, and the production of hay is unknown. The area devoted to soil-building crops such as legumes is rather small.

Next to cereals, dates are the most important crop. There are about 20.2 million date trees, of which about 9.7 million are along the Shatt al Arab near Basra and the balance in the central valley districts of the Tigris and the Euphrates and the Diyala River Valley. Dates are a staple food over most of Iraq and date exports, particularly from the Basra area, contributed 31 percent by

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

value of the country's total exports, other than oil, in the years 1948-1950. Citrus fruit, grown for domestic consumption, is of considerable importance in the Diyala River valley and substantial quantities of other fruits and nuts, although of rather poor quality and marketability, are grown in the North, especially in Sulei-maniya and Erbil. Vegetable culture is of particular importance in the neighborhood of large cities.

Agricultural yields are generally low, although most of the soil is inherently quite fertile. Barley yields, for instance, are about 30 to 35 percent less than those in Canada and the United States and probably slightly less than those of Turkey and Iran. Little or no animal manure or fertilizer is applied, animal dung being used largely for fuel. Salinity attributable to poor drainage has materially lowered productivity of land in the irrigation zone. The soil is often poorly prepared, and weeds detract from the yields. Chief reliance is placed on the fallow system to restore soil fertility, but, since fallow land is often allowed to go up in weeds on which animals graze, its efficacy is limited.

The raising of livestock is an important industry. Sheep and goats predominate because they thrive despite poor grazing and feeding.

TABLE 6

ESTIMATE OF LIVESTOCK POPULATION, 1949-50

Sheep	7,489,700
Goats	1,754,300
Cattle	1,034,600
Buffaloes	200,700
Camels	279,200
Horses	183,800
Mules	66,850
Donkeys	326,400

Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural

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Dates

Dates, one of the principal foods of Iraq, are also a main export crop. While Iraq's pre-eminence in the world date market will not easily be threatened, the quality of dates has apparently declined and replacement of old trees has been far from adequate. Not more than 15 percent of the old gardens have under way a tree-planting program sufficient to replace old and deteriorating stands. More than 60 percent of the gardens are in poor condition owing to inadequate cultivation. Halfa, Johnson and Bermuda grasses have been allowed to become serious pests, causing considerable damage. Yields could be improved by better cultivation, manuring, fertilization, reduction of other fruit trees planted in date gardens and improvement in irrigation through the cleaning of canals and the installation of more pumps. Processing of the crop could also be improved, for old packing sheds where primitive methods of handling are employed are still in use.

Responsibility for promotion and improvement of the date industry is entrusted to the Date Association under a law approved in 1935. Ever since 1939 the Association has had a contract with the Andrew Weir Company whereby the latter undertakes to buy at fixed prices and export all the dates of the best varieties offered for sale from the Basra district. There is general agreement among the growers that this arrangement has helped to stabilize prices. On the expiration of the current contract with Andrew Weir after the 1952 season, the Association hopes to conclude a similar agreement with a newly-formed Iraqi company. The Association, the growers and the foreign companies engaged in the date trade are each expected to subscribe one third of this company's capital of ID 500,000. Consideration is also being given to extending its price-support operations to the dates grown in the Tigris-Euphrates valley. In addition, the Date Association is contemplating a distillery to convert into alcohol dates which are surplus to market needs.

There is considerable danger that in carrying out these ambitious plans the Association will neglect the need for better cultural practices stressed above. The Association has already been criticized for doing little to improve the production of dates. It would be unfortunate if it followed the precedent set by the Tobacco

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654 Monopoly which seems to have lost sight of one of its primary
245 objectives, namely, to raise the quality of tobacco. Moreover, before the Association and its Iraqi "marketing" company undertake the contemplated stabilization program, there must be reasonable assurance that prices are not fixed at excessively high levels owing to political pressures and that the company has ample financial resources. An operation of this character is likely to be highly speculative. While large profits may be earned in some years, severe losses will be incurred in others. With respect to the projected alcohol plant, caution should also be exercised. There is already one distillery making alcohol as well as arak. For the time being the demands for alcohol may make another plant appear attractive, but it is doubtful that in the long run dates can compete with other raw materials such as molasses as an economical source of alcohol.

Other Fruits

245 Iraq can grow a wide variety of fruits and nuts. Citrus fruit has been conspicuously successful in the Diyala River Valley and the number of plantings has increased greatly with the help of the Department of Agriculture which distributes the trees. A higher output could be achieved through the use of fertilizers, particularly nitrogen, and by better cultivation to discourage weeds and pests. Better storage facilities are also needed.

In some parts of the country, particularly in the North, conditions are quite favorable to the growing of deciduous fruits. The fruit, however, is poor in quality and seldom gets beyond local markets. The better grades of fruit are all imported from other Middle Eastern countries. Yet better care in pruning, cultivation, thinning and in the control of insects and diseases might well double the output of apricots, peaches and apples and greatly improve their quality. A rising standard of living should provide an incentive to higher production provided facilities are made available to can, dry and store the fruit. The proposed small-business section of the Industrial Bank might investigate the possibility of financing such facilities. The organization of transport to the market also requires attention.

Nut culture could also be expanded in the northern provinces. The possibility of top-working, budding or grafting improved

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

varieties of pistachio scions on established native pistachio trees should be given particular attention. Almond orchards could be increased to advantage.

Vegetables and Potatoes

Vegetable culture is concentrated in the neighborhood of the large cities where such products as radishes, lettuce, cabbage, cucumbers, squash, tomatoes and others are in good supply during the season. Unfortunately vegetables do not figure prominently in the diet of most people. Outside of the big towns little or no vegetables are eaten. In part, this appears to be due to the fact that tribal tradition holds the cultivation of vegetables in low esteem. However, where the sharecropper is inclined to grow vegetables, he may be discouraged by the lack of available land or the shifting of the area assigned to him for cultivation. If a determined effort were made by the government to enlist the cooperation of the landowners, it might not be too difficult to overcome these obstacles.

It might be desirable to increase the production of potatoes which are now imported to the value of about ID 100,000 per year. The lighter soils along the large streams in the provinces of Mosul, Erbil and Suleimaniya are particularly well adapted to the production of both Irish and sweet potatoes. With proper guidance in cultural practices and the use of fertilizers, planters in these areas could easily supply the country's needs. If it is demonstrated that potato yields compare favorably with other crops, the government might well encourage the planting of potatoes both by launching an educational campaign and by furnishing the necessary seed to planters. Special attention will need to be given to transport, however, and the growers will have to be shown how to build inexpensive potato bins or pits with sufficient ventilation, insulation and accessibility.

Tobacco

Tobacco has been grown to some extent in the North for centuries, although it was not until the last few decades that its production assumed importance. Even now, the value of the tobacco crop is probably no more than a tenth of that of wheat or barley. In the mountainous areas of Erbil and Suleimaniya, however, it is

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East
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yield of nearly twice that of wheat, it is more popular with farmers. In normal years Iraq grows sufficient barley to ensure an exportable surplus of some 300,000 tons. The main importers in 1950 were Holland and Great Britain.

Rice is grown mainly in the marshes of the Lower Tigris and Euphrates near Amara and Suq ash-Shuyukh and in the Hilla and Diwaniya *liwas*, especially in the marshes around Shamiya. A small quantity is grown by irrigation in the valleys of the Kurdish areas. It is sown as a summer crop for harvesting between September and November. Its yield and price are usually higher than those of wheat or barley, but it is more extravagant of water and its cultivation is therefore restricted by law (1932). Before the war there was a small exportable surplus, but exports in recent years have been confined to limited amounts of the inferior qualities.

Dates. Iraqi dates constitute four-fifths of the world's production; the Government has a special interest in their cultivation and marketing. The Shatt al-Arab area above Basra, where growing, packing, and marketing are managed by a Date Board representing all interests, has 18 million[1] trees; the other main producing area in Iraq is on the Euphrates upstream from Nasiriya. Date-palms need a plentiful supply of water, but its quality and that of the soil is less important. Some 350 varieties of date are said to be grown in Iraq, of which only four are usually exported in quantity. Total annual production in normal times averages about 288,000 tons; of this about half is exported and half consumed within Iraq, either as food—dates are a staple item of diet—in natural form or as date syrup, or as raw material for the spirit industry. Of the by-products, the fibrous trunk is used for rope-making and the powdered stone for cattle fodder. Selection and packing for export are improving greatly under the supervision of the Government Date Board. The main importers of Iraqi dates were, in 1950, India, the United States, Egypt, Great Britain, Canada, and Pakistan.

Forests

The forests of Iraq, covering an area of 18,000 square kilometres, are of variable density. They were at one time far denser and more extensive, but have been and are still being reduced by shifting cultivation, fires, and uncontrolled cutting and grazing. The Forestry Department of the Ministry of Agriculture is undertaking a programme of conservation and afforestation, which will safeguard the soil, increase timber and

[1] The official figure; the IBRD report gives a figure of only 9·7 million.

5: Harrison D-4 (1912-1924) 1924 M1 Middle East
Iraq MH1

162 level plains and raise, by means of the scanty rainfall,
311 a meager amount of wheat and barley in favorable seasons.

312 Along the rivers in their upper courses are a few gardens, irrigated by means of various draught animals and water-wheels, which elevate water from the stream to the level of the land above. At Gurna the Tigris and Euphrates join to form one river and at Mohammerah the Karun empties into this united stream. The three rivers thus flow into the ocean as one enormous waterway, known locally as the "Arab River." For the last hundred miles before the sea is reached, the fresh water of the river ebbs and flows with the tides, and by cutting outlets along the river banks gardens may be automatically irrigated twice a day if so much water is desired.
245 Along these lower stretches each bank of the river is lined with beautiful gardens, which reach a depth of some miles in places and extend in practically an unbroken expanse all the way up to Basra and in less prolific culture even as far as Gurna. These date gardens are beautiful things, beautiful for what they are now, and more beautiful still as a suggestion of what all Mesopotamia might be. They are also one of the most melancholy things in the world as reminders of what the past developed and the present has wasted.

311 The land has enormous resources for agricultural de-
134 velopment. That whole vast district may be made into the garden spot of the earth. The soil is the best in the world, river silt hundreds of feet deep. It is as level as a parlor floor, with just enough pitch between the big rivers, and between the north and south, to make irriga-
312 tion easy. All that is necessary is a perfected system of
185 irrigation, and although the necessary investment would

5: Harrison D-4 (1912-1924) 1924 M1 Middle East
Iraq MH1

311 which may play a prominent part in the economic development of the country, Mesopotamia may be regarded as
162 a purely agricultural land. From this standpoint it is best considered in two sections. There is the river-irrigated date-growing district to the south, with Basra as its center, and there is the district to the north inhabited by nomads, semi-nomads and river agriculturists, with its principal center in Baghdad and a second capital further north in Mosul.

312 The date gardeners along the river in the Basra terri-
245 tory resemble in many ways the cultivators that can be seen in any oasis town in Arabia. Their work is very similar. Irrigation systems must be constructed. Channels must be provided to carry the water to the roots of the date palms and to the squares of alfalfa and other crops. There is this difference, however, that the water flows of itself. Twice a day the tide of the ocean backs up the water of the great Arab River as far as Gurna, about a hundred miles from the sea. The extensive cultivation of dates stops at that point. The water can be shut out of a field if so desired, or the gates can be opened and as much allowed to enter as is needed. The supply is unlimited and can be had twice a day the year around. The soil is ideal. It is rich and hundreds of feet deep. In natural endowment Mesopotamia is a paradise for date gardeners.

511 As a matter of fact, however, that country is far from a paradise for date gardeners. The favorable conditions ought to make their work easier and their remuneration greater, but the facts are otherwise. Their condition is worse than that of the cultivators in Hasa. It is the story of the Bahrein pearl banks over again. The increased wealth of the Bahrein pearl banks has not bene-

5: Harrison D-4 (1912-1924) 1924 M1 Middle East
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As compared with the southern district the northern part of Mesopotamia grows only a small amount of dates. There are a few gardens around each city, which furnish fresh dates for local consumption during the season, but in this region water has to be raised from the river to the ground level by animals, by the method in use in Arabia. The gardens are small and confined to the river-side and are of no real significance in the economic support of the country. These northern regions are not devoid of rainfall, and a meager return is secured by sowing wheat and barley on unirrigated land. Such cultivation, however, is uncertain, and in about one year out of every three the crop is a dead failure.

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The great mass of the people are nomadic or semi-nomadic. Everywhere there can be found pasturage for the nomad's flocks and herds and wells for the watering of stock. Many of the Bedouin nomads engage in agriculture occasionally in good seasons. Even among those who refuse to degrade themselves by becoming agriculturists of any degree, the standards of life are considerably higher than among the Bedouins of Central Arabia. The supply of forage is more abundant, and their flocks of camels and sheep and goats are very large. These nomads have better clothes, very much more abundant food, and in every way live a more tolerable life than that of their brothers in the Central Arabian desert. Horses are common in Mesopotamia. They are a luxury but not such a tax on the resources of the owner as farther south, for there are always forage and water for them. Every Arab of position expects to own and ride one; otherwise he loses caste. Arab horses are beautiful animals and are trained as household pets, much as a fine dog is trained with us. They are ridden without saddle

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245 356 Iraq produces about 80 per cent. of the total
[429] world supply of dates—that is, of the proportion of dates that form an article of commerce, because most dates are eaten directly by the growers, or else bartered. The general conditions under which date palms thrive have already been touched upon, and it is sufficient to recall that the palms can flourish in dry, saline, sandy, loamy, or even water-logged soils, although the maximum yield of fruit is obtained when abundant water is available.

The region of the Shatt el Arab is pre-eminently suited to date-production, and both banks are lined with date groves extending inland for about a mile and a half. Some 25 to 30 million palms are cultivated throughout the region, and of these, one-half are found close to the Shatt el Arab, the rest occurring along the river banks as far north as Latitude 33° N. A curious feature is the rise of the river under the influence of the incoming tide. Fresh water is ponded back in the Shatt el Arab, and floods the banks to a depth of as much as 3 feet to provide natural and regular irrigation of the groves—a phenomenon that from the point of view of the native farmer is wholly estimable.

In order to ensure a good crop, the land is dug over once every four years; and because of the frequent presence of creeks and water-courses, this must be done by hand. Artificial pollination is, as we have already seen, highly necessary; and though most groves include 3 per cent. of male palms, the district of Fao has developed a special trade in male pollen dust, from which other date-growing regions are supplied.

About 130 varieties of date are known, but three are most widely grown. The *Halawi* palm produces the finest fruit, but gives only a moderate yield (44 lb. per tree) (Dowson), whilst the *Sayir* produces slightly less, but is more tolerant of inferior growing conditions, and is probably the most widely grown. The *Zahidi* does not give a fruit of high quality, but the yield is over 120 lb. per tree, and this compensates for the low price obtained. Fertilisation of the female palm takes place in April, and picking begins in August, when large numbers of nomadic tribesmen move into the date-growing areas to work as seasonal harvesters.

273 231 313 289 Besides forming an extremely important part of local diet, dates are used in the distilling of *arak*—the chief fermented beverage outside the vine-growing areas, and one thought to have value as a prophylactic against malaria. The crushed stones are fed to cattle, and both leaves and trunk of the palm are used in light constructional work (houses, boats, even bridges), and also in the manufacture of paper.

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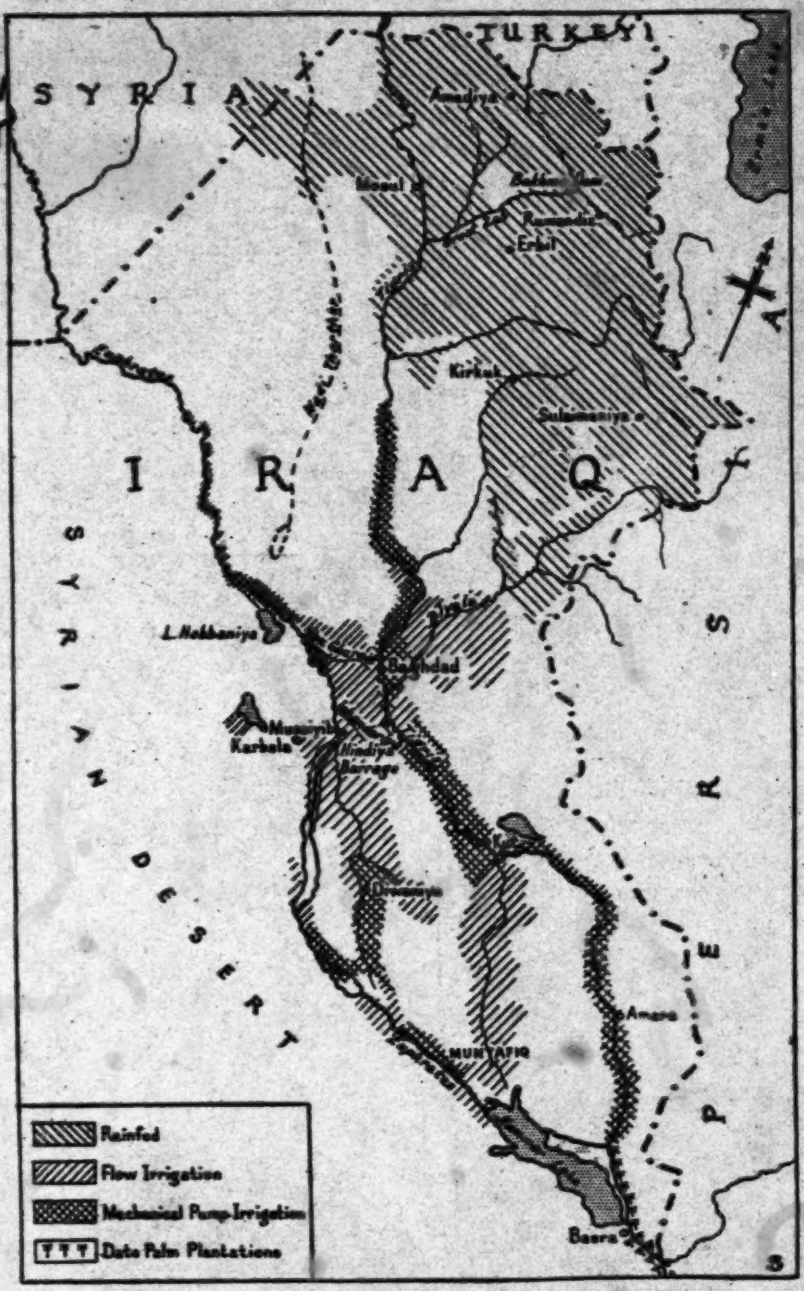

IRAQ: TYPES OF CULTIVATION

35: Hooper and Field 5-5 (1934) 1937 MAI Iran MAI
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as a plaster to sores and wounds. The drug contains resin 65, gum 20, and essential oil 10 to 20 per cent.

Ferula persica Willd. (Umbelliferae)

سکبینج

Sakbīnaj (Teh.); Saka-binaja (Ar.); Sek binedge (Schl.); Sagapenum gum.

Achundow; Ait.; Schl.; Laufer 366; Ph. Ind. 2: 161.

Field 163; K.B. 317; W.H.M.M. 150922.

Sagapenum is a fragrant gum-resin obtained from Laristan and Kerman. It is found in the market in tears or agglutinated into brownish yellow cakes with a persistent, alliaceous odor and acrid taste. It yields on distillation a volatile oil containing sulphur. [314]

The drug has a local reputation as a plaster for rheumatism and lumbago.—Mixed with linseed oil it forms a salve for the relief of piles and pains in the back (H.F.).

Ferula Sumbul Hook. f. (Umbelliferae)

ریشه کلفس

Rīshah-i-kalafs, Sumbul, also the name for celery root (Teh.); musk or violet root.

Field 134.

This is a large, perennial plant of Samarkand. The root is thick and fusiform, light and spongy, transversely wrinkled, with corky, brown bark, and fibrous, whitish interior with resinous cells. The odor is strong and musk-like, and the taste bitter and aromatic. It is employed as a stimulant, nervine tonic, and antispasmodic, given in hysteria and nervous disorders.

Ficus Carica L. (Moraceae)

تین

Tīn; common fig.

The edible fig grows wild in the mountain valleys of Kurdistan and in the foothills, and is also cultivated throughout Iraq as a fruit tree (G.).—The figs are usually sold strung on cords hung from the ceiling (H.F.). [262] [245]

Foeniculum vulgare Mill. (Umbelliferae)

ریشه رازیانه

Rīshah-i-rāziyānah (Teh.); the root of fennel.

35: Hooper and Field S-5 (1934) 1937 MAI Iran MAI
Iraq MHI

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Violet root or orris root was recognized in ancient Greece and Rome and has long been known throughout the East, where the root is used for its perfume and as a medicine. The drug is obtained from more than one species, and the specimens differ in their properties and aroma. Aitchison says the rhizome called Orisa in Afghanistan is brought from Bijnort to the Meshed market. Bombay is supplied with orris root from Iran and Kashmir, and some of the Irani root comes from Kurdistan. A specimen of Banafshah from Iraq (Field 23, Iraq) was a well-trimmed sample of orris root from Europe (*I. florentina* L.).—It is given as an infusion to relieve headache, and is prescribed for excessive labor pains (H.F.).

Jateorhiza Columba Miers (Menispermaceae)

کلمبو

Kulambū (Teh.); Kalamb-ki-jar (Hind.); calumba root.

Field 209; W.H.M.M. 150780.

Calumba root, obtained from climbing plants growing in the forests of the Zambezi in Portuguese East Africa, has established itself as a drug in nearly every part of the world. The dry root is met with in circular or oval, transverse slices about 1 to 2 inches in diameter. The taste is very bitter, aromatic, and mucilaginous. Calumba is employed as a stomachic and bitter tonic. It contains no tannin, so can be combined with iron salts.

Juglans regia L. (Juglandaceae)

گردو

Girdū (Teh.); Charmaghy (Pers.); Jawz-i-rumi (Afg.); Joz, Goz (Turk.); Guzk (Kurd.); Akhrot (Hind.); the walnut tree.

Field 270.

The walnut is a handsome tree in Iran, Kashmir, and China. The leaves, bark, nuts, and oil are used in medicine. In Iraq cultivated walnut trees, giving nuts with a soft shell, are called Chagzī, those with a hard shell, Metahk. The nuts are somewhat smaller than those of Europe. [245]

Juniperus excelsa Bieb. (Coniferae)

ابهل

Abhil, Aabb-el-harar (Teh.); Harhār-kohī (Afg.); Hab-el-a'ra'r (Ind. bazaars); juniper berries.

Field 248; W.H.M.M. 150876.

35: Hooper and Field 8-5 (1934) 1937 MAI Iran MAI
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This plant, allied to *Colchicum*, occurs in North Iran, Afghanistan, the juniper tracts of Baluchistan, and in the Punjab. Aitchison found this plant common all over the Badghis and Khorasan. The corms are collected as a medicine and exported from Meshed through Iran via the Persian Gulf to India. The drug is one of the forms of the ancient Hermodactyl. It is probably the Surinjan-i-shirin or sweet Surinjan, a medicine used by Mohammedans in India. The root from Hamadan is broken into pieces showing a white, starchy fracture with no perceptible taste or smell. The drug is said to have the same action as the bitter Surinjan (*Colchicum* spp.) as a remedy for rheumatism.

Mirabilis Jalapa L. (Nyctaginaceae)

تخم لال عباس

Tukhm-i-lāl'abbās (Teh.); Gul-i-abbasa (Pers.); fruits of the marvel of Peru.

W.H.M.M. 150895.

The marvel of Peru or four-o'clock is a plant of tropical America. It is named *Mirabilis*, or wonderful, on account of the variegated colors of the flowers, and *Jalapa*, as it was formerly supposed to be the true jalap plant. The fruits are oval or vase-shaped, 8 by 5 mm., dark reddish brown, five-ribbed, and papillate, containing a white, starchy seed. Little is known about its medicinal action, but the fruits have been said to be used in adulterating black pepper. [263]

Morus nigra L. (Moraceae)

شاه توت

The fruits: Tūt-i-kushk (Teh.).

The root: Rīshah-shāh-tūt (Teh.).

The tree: Shāh-tūt, "royal mulberry" (Pers.).

Field 46A, 269, 402; K.B. 327.

The black or grafted mulberry is cultivated in Iran and Baluchistan, principally for its fruit; the white mulberry (*M. alba*), for sericulture. They both yield fruit which in season is sold in the bazaar and met with in nearly every household (Ait.). When carefully dried, the fruits are called Tut-i-dham, and supply a wholesome and nutritious article of diet during winter. [262] [231] [245]

The other drug of the mulberry tree from Tehran consists of the bark of the root, reddish colored externally, with strong, silky white liber cells. It is used for dysmenorrhea.

35: Hooper and Field S-5 (1936) 1937 MAI Iran MAI
Iraq MHI

Field 69, 409; W.H.M.M. 150847; K.B. 303. I-I

The well-known dill is a tall, annual or biennial herb, with a strong, aromatic odor, finely dissected leaves, and umbels of yellow flowers. Dill fruits are sold in the bazaars and used as a condiment and carminative. On distillation they yield an oil used in medicine for the preparation of dill water. The plant is often confused with fennel and the fruit with caraway seed; hence the name Karawyah, sometimes used. In Iran dill serves as a potherb; the leaves are cooked with rice as a condiment to restore lost appetite. 824* 278* [263]

Phaseolus radiatus L. (Leguminosae) 824*

ماش 262

Māsh (Iraq, Pers.); Urd or Urid (Ind.); Masha (Sans.); the seeds.

Field 76A, 274; 5, 60 (Iraq).

Mash is cultivated as a summer pulse crop, sometimes mixed with maize or sorghum. The green pods are eaten as a vegetable, and the plant is used as fodder or green manure. The small, green, oblong beans are cooked and eaten, made into biscuits, cakes, and sweetmeats. In Afghanistan this pulse is so much esteemed that it is called Mash-i-maha, "the king of peas." [246]

Phaseolus vulgaris L. (Leguminosae)

فاصولیه

Fāsūliyah (Iraq); Lubia, Lubia-kermiz (red) (Teh.); Rāzmah (Kash.); French bean; the seeds.

Field 69, 70, 77A, 75 (Iraq).

The French or kidney bean is grown as a vegetable or a pulse in kitchen gardens. The pods can be eaten green and the ripe seeds dried as haricot beans, or white soup beans.

The beans are ovate, oblong, 12 to 14 by 6 to 8 mm., white, red, or brown, splashed with black streaks, the hilum on the inner side.

Phoenix dactylifera L. (Palmae) 824* 245 • 262

نخل تمر

Tamr (ripe fruit), Rutab (half ripe), Khalal (unripe), Nakhli (male tree), Khurmā; the date palm, date.

Date gardens are found on both sides of the Euphrates from An Nasiriya to Basra. From Nahr Umr down the Shatt-al-Arab to Fao is the largest date-growing district in the world. There are

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date gardens on both banks which vary in width from a few hundred yards to five miles. The date is the most important crop in Iraq (G.).

The best variety of Iraq dates is grown in the Suq district. The finest fruit is produced when the tree is between twelve and forty years old. Over a hundred varieties are known, but in Iraq they may be divided into two classes: (*a*) those used chiefly for trade; (*b*) those used for local consumption.

(*a*)	(*b*)
1. Halawi	1. Mishi
2. Khadrawi	2. Gentar
3. Sa'ir	3. Hasawi
4. Dairi	4. Khasib
5. Za'adi	5. Libur
6. Digal	6. Barhi

Of these 60 per cent are of the Sa'ir variety. The Halawi are popular in America, the Khadrawi sell in Europe while India and Iran are content with the Sa'ir varieties. The numerous uses of the date palm are proverbial.—The fruit yields a syrup and is used in making the local spirit, 'araq (H.F.).

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Phyllanthus Emblica L. (Euphorbiaceae)

آمله ميته

Amulah-i-suftah (Teh.); Amulah-mugashshar (Isf.); Amlaj (Ar.); Aola amla (Hind.); Kurk amla = dried fruit, Amla morabba = preserved fruit, in Turkestan; emblic myrobalans.

Field 16 (Isf.); W.H.M.M. 150871.

This tree grows throughout tropical India, and is valued for its fruits which, when dried, constitute the emblic myrobalans of commerce. As met with in the shops, the drug occurs in broken sections of a fruit, smaller than a walnut, with dried pulp and hard, woody endocarp. The pulp is very acid and contains much tannin. The fruit is astringent, stomachic, and refrigerant; mixed with grape juice and honey it is a favorite drink for fever and diarrhea.

Physalis Alkekengi L. (Solanaceae)

كاكنج

Kākanj (Isf., Teh.); Gul-i-kākanj; Alkikenji (Ar.); clammy winter cherry.

Achundow; Boiss. 4: 287; Post; Ait.; Schl.; Ph. Pers.; Ph. Ind. 2: 560.

Field 12 (Isf.), 162; W.H.M.M. 150721; K.B. 330.

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This agaric occurs on the oak and larch, and in sizes as large as a fist or a child's head; it is light, spongy, and friable, and is not easily powdered. The use of this fungus in medicine is of very ancient date. Avicenna insists upon the great efficacy of agaric as an alexipharmic. Mohammedan physicians closely follow the Greeks in considering that it removes all kinds of visceral obstructions and expels diseased humors. It is also a Chinese drug. The light, white, spongy interior is made into touchwood, spunk, or tinder, and was formerly used to absorb blood and secretions from wounds, etc.; hence the old name Fungus or Boletus Chirurgorum given to the plant.

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Prosopis Stephaniana Kunth (Leguminosae)

خرنوبان

Kharnūbān, Kornub (Isf.); Shok (Ar.); Kunbut (Syr.); Chughak: "humpbacked, bent," applied to the contorted pods, Tukhm-i-jinjak (Ait.); the pods.

Field 403.

This is a loose, straggling, thorny shrub of the Caucasus, Syria, Iran, and northern India. The pods are brown or copper-colored, 4 by 1.5 cm., galled, swollen, and contorted, containing several oval, brown seeds separated by soft, spongy dissepiments. The pods are eaten by sheep, but the seeds pass through undamaged and germinate readily at the coming of the winter rains (G.). The pods and roots of the plant are regarded as astringent and are given for dysentery.

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Prunus Amygdalus Stokes var. **amara** Baill. (Rosaceae)

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بادام تلخ

Bādām-i-talkh (Teh.); bitter almonds.

Field 52A, 171.

The bitter almond tree, like the sweet, is a native probably of Iran and Asia Minor, and is indistinguishable in botanical characters. In form and appearance bitter almonds closely resemble Valencia almonds, but are usually smaller. They are employed in confectionery and for flavoring, but as the hydrocyanic acid yielded by them varies in quantity, they should be used with caution.—An ointment made of bitter almonds is applied to furuncles (H.F.).

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Prunus Armeniaca L. (Rosaceae)

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زرد آلو

The fruit: Zard ālū (Pers.); Mishmish (Iraq); Khūbani, with stones removed (Hind.); dried apricot.

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The seeds: Hasta-i-nard ālū.

Field 80, 89 (Iraq); 108A.

The home of this tree is in the Caucasus region. Dried apricots are called Pating in Afghanistan, and Chuli by the Botes. Sheets of compressed apricot pulp are sometimes sold in the market as Qamr-ad-din. In this form the dried apricot preserves its flavor for an indefinite period; it can be used as required after soaking in water, when it swells into a nutritive paste like jam. This substance was one of the rations issued to Turkish soldiers during the War (G.). Apricot kernels, called Stigu in Afghanistan, are used as almonds.

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Prunus Cerasus L. (Rosaceae)

هسته آلبالو

Hastah-i-ālbālū (Teh.); Karaz (Ar.); Kerasza (Hind.); cherry stones.

دم آلبالو

Dam-i-ālbālū (Teh.); cherry stalks or peduncles.

Field 144; W.H.M.M. 150810, 150860.

The sour or bitter cherry is a tree of western Asia and eastern Europe. The fruits are light brown, resembling those of the common cherry. The seeds contain kernels having the odor of bitter almonds, are nutritive and tonic and are used in confections. The cherry tree and other plum trees in Iran yield a useful gum called Sumgh alucha.—Cherry stones mixed with barley awns, and cherry stems, are given as an infusion for gonorrhea (H.F.).

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Prunus domestica L. var. Juliana (Rosaceae)

آلوچه

Alūchah (Teh.); Anjar (Iraq); Halu zhgarh (Kurd.); Alucha (Hind.); prunes.

Field 268, 95A, 104A.

The dried plums are black, wrinkled, ovate, 20 mm. long, with a sweet, pleasantly acid pulp; the seed is 14 by 12 mm., the kernel has an odor of bitter almonds. On account of their acidity they are preferred for cooking, and are used for cleaning metal.

Prunus institia L. var. bokharensis (Rosaceae)

آلو

Alū, Alū-bokhara (Teh.); Bokhara plum.

Field 271.

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The fruit is globular, sweetish, and acidulous, surface compressed and wrinkled, color reddish or brown, with an odor like that of dates. Inside, the fruit is an almond-like nut in a hard shell, containing a kernel resembling sweet almonds. These plums may be used in place of prunes in the preparation of confection of senna. 8247 262 245 [257]

Prunus Mahaleb L. (Rosaceae) 8247 2787

حب المحلب

Habbu'l-ma'lab (Teh.); Hab-ul-mahaliba (Ar.); Paiwand-e-maryam (Pers.); perfumed cherry tree fruits.

Field 103 (Iraq); W.H.M.M. 150862.

This small tree occurs in Central Asia and Europe. The drug is found in the bazaars in two forms, the dried fruits and the kernels. The fruits are drupes, brown and oval, 9 by 6 mm., with a wrinkled skin, covering a fragile shell and the kernel. The kernels are light brown in color, ovate, 6 by 4 mm., with the taste of bitter almonds. They are used by Arabian physicians as a stomachic and for general debility.

Pterocarpus santalinus L. (Leguminosae)

صندل سرخ

Sandal-i-surkh, Rātiyanah (Teh.); Lal-chandan (Hind.); Ratanjali (Guz.); red sanders, red sandalwood.

Field 193, 232.

This wood is the Rakta chandana of Sanskrit writers. It comes from southern India, where the felling of the trees is under government control, and yields a considerable revenue. Hindus and Mohammedans use this wood combined with white sandalwood in bathing and religious services. The use of the red wood in powder for treating bloody fluxes must be based on the "Doctrine of Signatures." The drug called Rātiyanah in Tehran, a remedy for dysentery, appears to consist of chips of this wood. Red sandalwood is well known in Europe as an ingredient in French polish.

Punica Granatum L. (Lythraceae)

گلنار فارسی

Gulnār-i-farsi, Gul-i-anār (Teh.); Nar (Turk.); Gul nare-farci (Schl.); Flores Punicae granati (Ph. Pers.); pomegranate flowers.

Achundow; Ait.; Post; I.H.B.; Fl. Br. Ind. 2: 581; Ph. Ind. 2: 45; Boiss. 2: 736.

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Field 77, 157; W.H.M.M. 150738; K.B. 333.

ریشه انار

Root bark: Rishah-i-anār (Teh.); Granati Cortex (Ph. Pers.).

Field 184.

Seeds: Chab roman (Bagh.).

Field 98A.

The pomegranate is a small tree with showy, reddish flowers, growing in subtropical countries. The flowers, rind of fruit, and dried bark of the stem and root are medicinal. The flowers are astringent and stomachic; the rind of the fruit is also astringent and is used for dyeing and prescribed for dysentery; the root bark is vermifuge and used for expelling tapeworm; the alkaloid pelletierine is its active principle.—The flowers, powdered with *Nummulites* sp. and *Rhus coriaria* L., are applied to painful gums.

Imm-harmal is a variety with small, black fruits which are used medicinally only (H.F.).

Pyrethrum sp. (?) (Compositae)

Katek bah (?) (Teh.).

K.B. 333.

This drug consists of a tapering root with a few undeveloped leaves arising from the crown. The root has the characters of a composite and the leaves resemble those of a *Pyrethrum*.—The sample is marked "Poison, used as an eye medicine" (H.F.).

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Pyrus Cydonia L. (Rosaceae)

تخم بهدانه

Tukhm-i-bihdānah (Teh.); Bibi (Bal.); quince seeds.

Field 5; 53A.

The quince is a native of Central Asia, and is grown for its fruit in most temperate countries. Seeds used in and exported from Iran are irregularly ovoid, angular, adherent to one another by mucilage, and covered with a membrane; the color of the testa is dark brown, and that of the kernel yellowish white; they have the odor and taste of bitter almonds. When roasted and salted they are called Hab-safarjal. The seeds contain a large quantity of mucilage, which favorably recommends them as nutritive, demulcent, and emollient for coughing and dysentery; they are taken in the form of an infusion.

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scarlet foliage. The fruit and root-stock of wild rhubarb are collected and employed in medicine; the fruits were official in the "Pharmacopoeia Persica." A decoction of the reddish, triangular-winged fruits is considered a more powerful purgative than that of the rootstock (Aitchison). The fruits are used in Tehran as a vermifuge for horses, and in Hamadan the drug is applied as a poultice for headache. The rhubarb leaves from Isfahan are made into an infusion and used for gonorrhea (C.).

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Rhodymenia sp. (Florideae, Rhodymeniaceae)

لیتا

Lyka, Leeka (Iraq); Chinai-ghasa or seaweed.

Field 31A.

This alga, obtained in northern Iran, is light brown and gelatinous. A decoction is given for coughs. As a substitute for agar-agar, it is emulcent, emollient, and alterative, and may be used as a cultivating medium for bacteria.

Rhus coriaria L. (Anacardiaceae)

سماق

Summāq, Summāq-i-shakki bī hastah (Teh.); Tirsh (Kurd.); Tartak (Hind.); leaves, bark, and fruits.

Achundow; Schl.; Boiss. 2: 4; Post; Ait.; Ph. Ind. 1: 373.

Field 164, 272; 107 (Iraq); W.H.M.M. 150800; K.B. 335.

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The sumac is a tree cultivated in Khurasan, western Afghanistan, and throughout Central Asia. The leaves have long been used by the Arabs, Turks, Iranis, and in Europe, for dyeing silk and tanning leather. They contain from 15 to 35 per cent of tannin.

The fruit is exported from Iran and used by Mohammedans in India. It is a small, sticky drupe, the size of a lentil, 5 mm. in diameter, red or green, acid, and astringent to the taste, containing one lenticular, polished, brown seed.

—Mixed with *Punica Granatum* L., sumac is applied to relieve painful gums. The seeds in an infusion are used to acidulate foods (H.F.).

Ricinus communis L. (Euphorbiaceae)

گرچک فرنگی

Garchak farangī (Teh.); Varchak (Ham.); Tochme Kertchec (Schl.); Kurwa (Ar., Iraq); Bedanjir, "willow fig"; castor oil seeds.

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Field 264; 4, 12, 36, 53 (Iraq); W.H.M.M. 150739; K.B. 335.

The castor oil plant[1] is a native of India, but is common now throughout tropical and subtropical countries. In Iraq and Iran it is cultivated as a windbreak for cotton and other summer crops and in gardens as an ornamental plant. It may attain a height of 10 meters and be a perennial tree, but in cooler climates it is either a shrub or an annual herb. With variations of the plant there are also varieties, large and small, of the seeds. The four samples from Iraq were classed as follows: "Abhangi seeds" 15 by 9 mm., "ordinary" 13 by 10 mm., "Indian red-stemmed" 11 by 8 mm., "Syrian Baladi" 13 by 11 mm. The most important constituent of castor seed is the fixed oil, which exists to the extent of about 50 per cent. The oil is used as a lubricant, as an illuminant, and in medicine as a safe purgative. The oil cake contains all the poisonous property originally present in the seed, hence can not be used as a cattle food; it is, however, an excellent manure and fuel.

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Roccella Montagnei Bél. (Ascolichenes, Roccellaceae)

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دوالة

Davālah (Ham.); a lichen.

Field 28A; W.H.M.M. 150824; K.B. 336.

Achundow refers this drug to *Muscus arboreus*, and gives the Persian names as Dawalak and Karbasu and the Arabic name as Aschna (*Usnea* sp.). The Persian name Davālah is applied to more than one kind of lichen, since Dymock gives *Parmelia kamtschadalis* Esch. as the source of this drug in the Indian bazaars (Ph. Ind. 3: 627). In the Field collection from Baghdad, No. 28A, this drug occurs under the name of "Lihayat as-shāyib." Some of the Parmelias are used as a dye. They are gray lichens, in broken pieces, having emollient and astringent properties, used in a bath or as a poultice.

Rosa damascena Mill. (Rosaceae)

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گل سرخ

Gul-i-surkh, "red flower" (Teh.); Ward (Ar.); flowers of red rose.

Field 42A; W.H.M.M. 150763.

The rose of Damascus is largely cultivated in western Asia. In Turkey, Bulgaria, and the south of France this species yields attar of rose and is the flower from which the official rose water is prepared.

The petals are slightly astringent, and are used chiefly as an agreeable astringent or as a coloring agent. "Gulanjabin," of rose

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[1] [Ricinus communis --ANALYST]

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I-I The Merian gole of the "Terminologie is referred to

824* *Salvia officinalis* L., but according to Gilliat-Smith, this plant,
278* although cultivated in gardens in Tabriz, has no local name and is
247 not used by the natives.

Boiss. 4: 821; I.H.B.; Ph. Ind. 3: 125.

Field 130; W.H.M.M. 150799; K.B. 341.

This plant is the poley germander or polion of the Greeks. The drug consists of the small, woolly flowers, mixed with some stalks and leaves. It has the fragrance of thyme, and is given as an infusion for internal disorders—to relieve pains during pregnancy (H.F.). In Baluchistan *T. Stocksianum* Boiss. is called Kalpora, and is a remedy for fever.

824* **Thea sinensis L. (Theaceae)**

272 چای سبز

245 Chā'ī sabz (Teh.); Chā (Hind.); green tea leaves.

W.H.M.M. 150820.

A sample of prepared green tea. Tea is imported in immense quantities, chiefly from southern Iran and India. Iranis are very fond of this beverage; prepared tea is sold in nearly every bazaar.

According to Laufer (pp. 553–554) "in Mongol, Turkish, Persian, Indian, Portuguese, neo-Greek, and Russian we equally find the word *čai*, based on North Chinese *c'a*. The Tibetans retain the Chinese word in the ancient form *ja* (*dža*)."

824* **Thymus Serpyllum L. var. Kotschyanus Boiss. (Labiatae)**

278* کوشان شیرازی

Jōshan Shīrāzī (Teh.); Zatār (Syr., Iraq); Seetere (Schl.); Djūshā (Pers.); the herb.

Ait.; Boiss. 4: 556; Post; Schl.; Fl. Br. Ind. 4: 649; Ph. Ind. 3: 114.

Field 75A; K.B. 341.

This variety of thyme is a plant of Iran and Kurdistan. The leaves are rounded, cuneate, ovate to lanceolate, with prominent nerves below. The leaves are fragrant, and resemble those of *Zataria multiflora* Boiss., a plant which also has the name of Zatar. Post applies the name Zatar to all plants of the genus *Thymus*. Boissier, on the other hand, refers Zatar to *Origanum Maru* L., Zatar farisi to *T. capitatus* L., and Zaeteran to *T. decussatis* Boiss. It would thus appear that Zatar and Jōshan Shīrāzī are similar drugs, characterized by a thyme-like aroma. The leaves are carminative.